VOL. 8. JANUARY, 1935. NO. 1.

Journal
OF
Kansas Entomological Society

PUBLICATION COMMITTEE

PAUL B. LAWSON, Editor, Lawrence
ROGER C. SMITH, Manhattan R. H. PAINTER, Manhattan
W. KNAUS, McPherson DWIGHT ISELY, Fayetteville, Ark.

EDWIN A. POPENOE
1853—1913

Entered as second-class matter December 31, 1927 at the Post-Office at McPherson, Kansas, under the Act of August 24, 1912.

Kansas Entomological Society

Vol. 8, No. 1. January, 1935.

NEW SPECIES OF GALL MIDGES FROM TEXAS

E. P. FELT, Stamford, Conn.

The new species described below were all reared from Texas galls by Dr. R. H. Painter during the years 1921 to 1924 and submitted to the writer for identification. The number in parenthesis and the preliminary statement were given by him and the species were later numbered in the New York State Museum series where the types are deposited.

This work of his has resulted in a material addition to our knowledge of the galls of the southwestern area, not only by the discovery of new species, but also on account of the biological data presented by him in a subsequent paper.

Asphondylia amaranthi n. sp.

A number of small midges were reared (No. 103) in December, 1922 from galls on **Amaranthus blitoides reverchonii** Ulin and Bray, collected at Austin, Texas.

Male. Length 2 mm. Antennae nearly as long as the body, sparsely haired, light brown, 14 segments, the fifth with a length 4 times its diameter, the 14th with a length 3 times its diameter. Palpi, first segment transverse, the second and third nearly equal, each with a length about 3 times the diameter; mesonotum dark brown, scutellum and postscutellum yellowish-brown, abdomen brownish, halteres fuscous yellowish, legs a dark straw. Genitalia, basal clasp segment globose, terminal clasp segment short, stout, feebly bidentate; dorsal plate broad, deeply and broadly emarginate, the lobes angularly rounded.

Female. Length 2.5 Antennae nearly as long as the body, sparsely haired, fuscous yellowish, 14 segments, the fifth with a length 4 times its diameter, the 14th with a length ¾ its diameter. Color characters practically as in male. Ovipositor a little longer than the abdomen, dorsal pouch well developed.

Type Cecid. A3311, N. Y. State Museum.

Asphondylia abutilon n. sp.

A series of moderate sized midges were reared (No. 116), August, 1922 from the elongated closed sepals of

Abutilon incanum Swett, collected at Austin, Texas.

Male. Length 2.75 mm. Antennae nearly as long as the body, sparsely haired, dark brown, the fifth segment with a length 5 times its diameter. Palpi, first segment subglobose, the second quadrate, with a length nearly 3 times its width, the third slender, with a length twice that of the second; mesonotum dark brown, scutellum and postscutellum yellowish, abdomen fuscous yellowish, halteres pale yellowish, legs pale straw, claws rather slender. Genitalia, basal clasp segment greatly swollen, terminal clasp segment short, stout, strongly bidentate, dorsal plate broad, deeply incised, the lobes subquadrate.

Female. Length 2.75 mm. Antennae nearly as long as the body, the fifth segment with a length 5 times its diameter, the distal segment with a length nearly equal its diameter. Palpi, first segment globose, the second rather broadly oval, with a length 2½ times its diameter, the third more slender, nearly twice as long as the second; ovipositor nearly as long as the abdomen, the dorsal pouch well developed.

Type Cecid. A3315, N. Y. State Museum.

Asphondylia buddleia n. sp.

Several small midges were reared November 13, 1922 (No. 95) from the aborted ovary of **Buddleia racemosa** Torr. collected at Austin, Texas.

Male. Length 2.5 mm. Antennae probably as long as the body, sparsely haired, light brown, the fifth segment with a length a little over 4 times its diameter. Palpi, first segment subglobose, the second with a length nearly 3 times its width, the third twice as long as the second, somewhat dilated apically; mesonotum dark brown, scutellum and postscutellum fuscous yellowish, abdomen reddish-brown, legs pale straw. Genitalia, basal clasp segment roundly swollen, terminal clasp segment short, bidentate apically, dorsal plate deeply incised, the lobes broad, broadly rounded apically.

Female. Length 2 mm. Antennae nearly as long as the body, yellowish-brown, the fifth segment with a length 4 times its diameter, the 14th with a length ¾ its diameter. Palpi, first segment broadly oval, the second with a length over twice its diameter, the third a little longer, swollen distally; mesonotum dark brown, scutellum and postscutellum yellowish-brown, abdomen reddish-brown; halteres whitish, transparent, ovipositor

about half the length of the abdomen, the dorsal pouch rather well developed, legs a nearly uniform dark straw.

Type Cecid. A3432, N. Y. State Museum.

Asphondylia clematidis n. sp.

A nice series of midges were reared in August, 1922 (No. 59) from an oval bud gall nearly ½ an inch in diameter, on **Clematis drummondi** collected at Austin, Texas.

Male. Length 2.5 mm. Antennae ¾ the length of the body, dark brown, 14 segments, the fifth with a length 4 times its diameter. Palpi, first segment subquadrate, the second with a length 2½ times its diameter, the third nearly 3 times as long, with a length 6 times its diameter; mesonotum dark brown, scutellum reddish-brown, postscutellum and abdomen fuscous yellowish, the legs pale straw, dorsal plate broad, broadly and slightly emarginate.

Female. Length 3 mm. Antennae nearly as long as the body, sparsely haired, pale yellowish, the fifth segment with a length 4 times its diameter, the 12th with a length 2½ times its diameter, the 13th with a length ¼ greater than its diameter and the 14th with a length nearly equal to its diameter; mesonotum dark brown, scutellum, postscutellum and abdomen fuscous yellowish, ovipositor about as long as the abdomen.

Type Cecid. A3314, N. Y. State Museum.

Asphondylia lacinariae n. sp.

A series of midges were reared April 15, 1924 (No. 125) from an irregular, apical bud gall, some one inch in diameter and apparently composed of a series of aborted, partly unfolded leaflets, on **Lacinaria punctata** Kuntze collected at Austin, Texas.

Male. Length 3 mm. Antennae nearly as long as the body, sparsely haired, yellowish-brown, the fifth segment with a length 5 times its diameter. Palpi, first segment globose, second with a length 3 times its diameter, the third slender, about twice as long as the second and with a length fully 7 times its diameter; mesonotum dark brown, scutellum and postscutellum fuscous yellowish, abdomen dark brown, halteres fuscous yellowish, legs pale straw.

Female. Length 3.5 mm. Ovipositor nearly as long as the abdomen, dorsal pouch well developed. Other characters obscure, due to the poor condition of the adults.

Type Cecid, A3434 N. Y. State Museum.

Asphondylia prosopidis Ckll.

1898 Cockerell, T. D. A. Ann. Mag. Nat. Hist., 7th ser, 2: 329-30

1916 Felt, E. P. N. Y. State Mus. Bul. 186, p, 149

The adults of this species have not been adequately characterized. The insects described below have been referred to this species. They were reared from a gall on the ovary of the flower of **Prosopis glandulosa** Torr. or mesquite, occurring at Austin and more commonly at Brownwood, Tex. The galls are apparently more common on low bushes, are full grown by June 7th and continue until the latter part of July or early August. The larvae are white and yellowish and fill the cavity of the widened pods. The galls develop quickly and the insect is badly parasitized. Adults were reared in June and July, 1921 (38b, 38c).

Male. Length 2.5 mm. Antennae distinctly longer than the body, sparsely haired, dark brown, the fifth segment with a length 6 times its diameter. Palpi, first segment apparently short, globose, the second with a length about twice its width, the third fusiform, with a length 6 times its major diameter; mesonotum very dark slaty brown, the submedian lines naked; scutellum dark reddish-brown, sparsely haired apically, postscutellum darker, abdomen dark brown, rather sparsely clothed basally with short, silvery hairs, halteres mostly pale yellowish, fuscous subapically, legs nearly uniform, pale straw; genitalia fuscous yellowish, basal clasp segment short, greatly swollen, rather weakly bidentate; terminal clasp segment very short, greatly swollen, dorsal plate divided, the lobes orbicular.

Female. Length 2.5 mm. Antennae nearly as long as the body, rather thickly haired, pale yellowish, the fifth with a length 6 times its diameter, the 14th with a length ¾ its diameter. Palpi, first segment subglobose, the second with a length about 3 times its width, the third slender, ½ longer than the second; mesonotum dark slaty-brown, the submedian lines nearly naked; scutellum dark brown, postscutellum yellowish, abdomen dark brown, sparsely clothed basally, with rather long, silvery hairs; halteres mostly pale yellowish, fuscous apically, legs mostly dark brown, ovipositor about as long as the body, the dorsal lobes rather large.

A3215, N. Y. State Museum.

Asphondylia ratibidae n. sp.

A series of midges were reared at Austin, Tex., May 25, 1921 (No. 10). They ran in our key for this genus to **A. thalictri** Felt, though they are very distinct therefrom.

The gall according to Mr. Painter is apparently produced by the sealing of the tops of both ray and disk flowers of **Ratibida (Lepachys) columnaris,** a cone flower collected at Austin, and Brownwood, Tex., May 14th.

Male. Length 3 mm. Antennae nearly as long as the body, sparsely haired, light brown, fourteen segments, the fifth with a length about five times its diameter, the terminal segment missing; palpi, the first segment short, subquadrate, the second with a length over twice its diameter, and the third one half longer than the second, more slender; mesonotum dark slaty brown, the submedian lines thickly haired; scutellum yellowish brown, thickly haired apically; postscutellum dark brown; the abdomen dark brown and rather thickly clothed with pale yellowish hairs basally and subapically, the distal segments with a distinct yellowish cast; halteres and legs mostly pale yellowish; the tarsi mostly dark brown. Genitalia, basal clasp segment greatly swollen, terminal clasp segment short, swollen; dorsal plate divided, the lobes broadly orbicular; the ventral plate rather long, deeply and triangularly emarginate: the lobes tapering roundly to a somewhat obtuse apex.

The male in this species does not show the chitinization of the harpes so marked in certain individuals of **A. thalictri** Felt.

Female. Length 3 mm. Antennae as long as the body, sparsely haired, light brown, fourteen segments, the fifth with a length five times its diameter, the twelfth with a length over twice its diameter, the thirteenth with a length about one-fourth greater than its diameter and the fourteenth with a length about three-fourths its diameter. Palpi, the first segment short, sub-quadrate, the second with a length about three times its diameter, the third nearly twice the length of the second, very slender; mesonotum very dark brown, almost black, the submedian lines thickly haired; scutellum yellowish brown, thickly haired apically; postscutellum dark brown; abdomen dark brown and rather thickly clothed with pale yellowish hairs; ovipositor, basal segment fuscous yellowish; halteres yellowish basally fuscous sub-apically; coxae dark brown; femora and tibiae yellowish brown; tarsi light brown; ovipositor when extended about one-half

longer than the abdomen, the dorsal pouch well developed.

Type Cecid. A3213, N. Y. State Museum.

Asphondylia verbenae n. sp.

The small midges described below were reared October 15 to 23, 1923 (No. 119) from the aborted ovary and lower corolla tube of **Verbena hallei** Small, collected at Austin, Texas.

Male. Length 2 mm. Antennae as long as the body, sparsely haired, light brown, the fifth segment with a length 5 times its diameter, the 13th with a length 4½ times its diameter, the 14th missing. Palpi, first segment subglobose, the second with a length about 3½ times its diameter, the third ¼ longer than the second and more slender; mesonotum dark brown, scutellum and postscutellum fuscous yellowish, abdomen reddish-brown, halteres fuscous yellowish, legs a nearly uniform pale straw, claws rather slender. Genitalia, basal clasp segment short, greatly swollen, terminal clasp segment short, swollen, apparently weakly bidentate, dorsal plate deeply and narrowly incised, the lobes orbicular.

Female. Length 2 mm. Antennae nearly as long as the body, sparsely haired, light brown, the fifth segment with a length 5 times its diameter, the 14th with a length ¾ its diameter; ovipositor nearly as long as the body, the dorsal lobes well developed. Other characters nearly as in the male.

Type Cecid. A3433, N. Y. State Museum.

Lasioptera kallstroemia n. sp.

A series of midges were reared October 16-24, 1922 (No. 16, No. 124) from a stem gall on **Kallstroemia intermedia** Rydb., collected at Austin, Texas. The galls are found mostly at the nodes, the stem being enlarged to about three times its normal size, the gall subconical, the major diameter being ¼ of an inch.

Female. Length 1.5 mm. Antennae extending to the base of the abdomen, sparsely haired, dark brown, 18 to 20 segments, the fifth with a length equal to its diameter; terminal segment somewhat reduced, ovoid. Palpi, first segment with a length about twice its diameter, the second about as long, broadly oval, the third one-half longer than the second, more slender and the fourth about as long as the third, somewhat dilated apically; mesonotum, scutellum and postscutellum

dark brown, abdomen apparently a nearly uniform reddish-brown, ovipositor with a length about half that of the abdomen, on the basal portion an oval group of dark brown, somewhat curved scales, terminal lobes long, rather broad, with a length about 4 times the width and a rather thick cluster of slender, strongly curved spines dorsally, legs a nearly uniform yellowish-brown.

Type Cecid. A3430, N. Y. State Museum.

Phytophaga painteri n. sp.

A series of these small midges was reared March 10, 1923 (No. 22) from a circular leaf gall on **Celtis mississippiensis** Bosc. and **C. reticulata** Torr. Collected at Austin and San Antonio, Texas.

Male. Length 1 mm. Antennae about ¾ the length of the body, sparsely haired, pale yellowish, 15 segments, the fifth with a stem ¾ the length of the cylindrical basal enlargement, the latter with a length about ½ greater than its diameter; terminal segment reduced, narrowly conical. Palpi, first segment subglobose, the second narrowly oval, with a length ½ greater than the width, the third a little longer and more slender than the second, the fourth more slender and about twice the length of the third; mesonotum dark brown, scutellum and postscutellum fuscous yellowish, abdomen yellowish-brown, wings rather broad, the third vein uniting with the margin just before the apex, halteres yellowish transparent, legs pale straw, claws rather long, moderately stout, the pulvilli as long as the claws. Genitalia, basal clasp segment moderately long, stout, terminal clasp segment swollen basally, rather slender apically; dorsal plate deeply and triangularly emarginate, the lobes broad, narrowly rounded apically.

Female. Length 1 mm. Ovipositor nearly as long as the abdomen, the terminal lobes broadly oval, with a length about twice the width. Other characters indistinguishable in the preparation.

Type Cecid. A3306, N. Y. State Museum.

Phytophaga sabinae n. sp.

Several midges, tentatively referred to this genus, were reared March 31, 1922 (No. 66) from inconspicuous, usually brownish swellings of the apical buds of mountain cedar, **Sabina sabinoides,** collected at Austin, Texas. The whitish, transparent exuviae protrude api-

cally from between the deformed leaflets.

Female. Length 1.5 mm. Antennae extending to the base of the abdomen, sparsely haired, 13 cylindrical segments, the fifth with a length 3 times its diameter and basally with rather thick whorls of long, stout setae; terminal segment reduced, with a length about ½ greater than its diameter. Palpi, first segment short, subquadrate, the second about as long as the first, the third and fourth each with a length about twice the diameter; mesonotum pale yellowish-brown, scutellum and postscutellum yellowish, abdomen yellowish-red; wings hyaline, narrow, with a length about 3 times the width, subcosta uniting with the margin at the basal half, the third vein at the apex, the fifth vein obsolescent near the basal third of the wing; halteres yellowish transparent, legs pale straw, the claws slender, rather weakly chitinized, the broad pulvilli longer than the claws; ovipositor short, the lobes broadly oval.

Type Cecid. A3436, N. Y. State Museum.

Phytophaga texana n, sp.

One male was reared April 10, 1922 (No. 45) from a somewhat capsule-shaped vein gall on **Celtis reticulata** Torr. collected at Austin, Texas.

Male. Length 1.75 mm. Antennae probably nearly as long as the body, sparsely haired, pale yellowish, 14 and probably 15 segments, the fifth with a stem a little longer than the cylindrical basal enlargement, the latter with a length about ¼ greater than its diameter. Palpi, first segment obpyriform, the second globoid, the third narrowly oval with a length about twice its diameter, the fourth more slender, with a length twice that of the third; mesonotum dark brown, scutellum, postscutellum and abdomen fuscous yellowish, wings hyaline, the third vein uniting with the margin just before the apex, halteres pale yellowish, legs pale straw, claws rather long, slender, the pulvilli as long as the claws. Genitalia, basal clasp segment long, swollen, terminal clasp segment swollen basally, tapering apically; dorsal plate deeply and triangularly incised, the lobes narrowly oval.

Type Cecid. A3308, N. Y. State Museum.

NEW NORTH AMERICAN AGALLIAN LEAFHOPPERS WITH NOTES ON OTHER SPECIES

P. W. OMAN,
Bureau of Entomology
U. S. Department of Agriculture, Washington, D. C.

In 1933* the writer presented a taxonomic treatment of the North American species of agallian leafhoppers. Since that time considerable additional material has been examined, resulting in the discovery of some new species and evidence which necessitates changes in the status of some forms previously studied.

Agalliopsis neopepino n. sp.

Closely related to, and previously confused with **A. pepino,** but with the lateral margins of the male genital plates straight and the aedeagus forked in posterior view. Length 3 mm.

Color: Generally paler than **pepino** with the dark markings less distinct. Face as in **pepino;** vertex with a fuscous spot next each eye, a median dash, a small spot on the anterior margin above each ocellus, and a larger one back of each of these on the posterior margin, the two sometimes fused. In **pepino** there is but a single elongate spot above each ocellus. Pronotal markings as in **pepino** but with the anterior dark border obsolete, the median line broader and indistinct on the posterior half, and the large spots on the disk more elongate, scarcely dark-margined except on the outer edge, and reaching the posterior margin of the pronotum. Scutellum and elytra as in **pepino** but paler.

Structure: Slightly more robust than **pepino,** otherwise similar. Second cross vein in elytra either present or absent.

External genitalia: Posterior margin of female segment very broadly and shallowly notched, much more so than in **pepino.** Male valve short and rounded behind, plates rather broad, lateral margins straight, gradually narrowing to bluntly pointed, slightly divergent tips. Posterior margins of tenth segment flaring and extending laterally beyond plates.

Internal male genitalia: Aedeagus in lateral view narrowly U-shaped. Posterior portion forked and in caudal view U-shaped with the tips converging and the

*U. S. Dept. Agr. Tech. Bul. 372.

ejaculatory duct opening at the base of the U. Inner point of style long and bluntly pointed, outer point short and blunt.

Holotype male from Ermita, Cuba, Feb. 17, 1925, Herbert Osborn. Allotype female from Cayamas, Cuba, June 6, E. A. Schwarz. Paratypes, 1 male and 6 females with the above localities and dates, 1 male from Herradura, Cuba, Feb. 14, 1925, and 1 female from Jobabo, Cuba, Feb. 10, 1925. Specimens from Cayamas collected by Schwarz, others collected by Osborn. Types in collection of the United States National Museum (Cat. No. 50363).

This species was recorded from Cuba by Osborn (Ann. Ent. Soc. Amer., Vol. 19, pp. 339-340, 1926) and the writer (U. S. Dept. Agr. Tech. Bul. 372: 12, 1933) as **pepino,** the latter record from female specimens only. The writer recognized the males obtained from Doctor Osborn as an undescribed species and is now inclined to believe that **pepino** does not occur in Cuba. In the writer's key to the genus **Agalliopsis***, **neopepino** runs to the couplet containing **conformis** and **pepino,** but the male genitalia will easily distinguish it from these.

Agalliopsis cincta Oman

Specimens of this species were included in Van Duzee's type series of **Agallia scortea** from Jamaica. The writer has not examined the type of **scortea** but Mr. Van Duzee reports that it is a male and larger than a female specimen of **cincta** sent for comparison. A paratype of **scortea** examined by the writer was much larger than **cincta** and differed in other respects as indicated in the description and keys. Osborn's† record of **scortea** from Cuba applies to **cincta.**

Agalliopsis florida, n. sp.

Related to **A. peneoculata** but slightly more robust and lacking the smoky band across the elytra. Length of female 4.5 mm.

Color: General ground color dull brown, the vertex, pronotum, and scutellum with a slight yellow tinge. Face golden brown with a small fuscous spot against the inner edge of each ocellus. Vertex with fuscous marks as follows: A narrow median line extending onto the

*U. S. Dept. Agr. Tech. Bul. 372: 8-10, 1933.

†Ann. Ent. Soc. Amer., vol. 19, p. 339, 1926.

pronotum and almost to the posterior margin, a spot above each ocellus, and a spot next each eye. Pronotum with a fuscous dash on disk each side of median line, a pair of dark points near anterior margin, and a faint anterior border of brownish. Scutellum with fuscous marks on basal angles and apex, and median transverse furrow and depressions in front of this, dark. Elytra uniformly brown, hind wings smoky.

Structure: About as in **peneoculata** but slightly more robust, the face broader, and the elytra a little broader apically.

External genitalia: Posterior margin of female genital segment slightly produced, broadly and shallowly notched medially.

Described from two females from Hilliard, Florida, August 19, 1930, R. H. Beamer. Holotype in collection of the University of Kansas, paratype in the United States National Museum Collection (Cat. No. 50364).

This species is also closely related to **scortea,** but is larger and darker, with more prominent markings on head and thorax and the ground color distinctly brown.

Agalliopsis cervina Oman

Described by the writer (U. S. Dept. Agr. Tech. Bul. 372:16, 1933) from a single male from Douglas County, Kansas. Female specimens have since been examined from Concan, Texas, collected by the writer, June 3, 1933, and Suwanee Springs, Florida, collected by R. H. Beamer, July 29, 1930. Doctor Beamer also collected one male in the Santa Rita Mountains, Arizona, June 27, 1933. The Concan, Texas, specimens were taken from live oak and the Arizona specimen came from the top of a blue oak **(Quercus oblongifolia).**

A brief description of the female sex is here given.

Color: Paler than the male, ground color of vertex and pronotum white, posterior half of pronotum unmarked except for faint median line and faint lateral dashes of golden. Elytra with an irregular band of white across entire width, broadening on costal margin.

Structure: Slightly larger and more robust than the male. Length 4.5 mm.

Genitalia: Last ventral segment slightly roundly produced, sometimes faintly notched medially.

Agalliopsis novellina, n. sp.

Related to **novella** but larger, with more brown coloration and very short lateral processes on the aedeagus. Length of male 4.25 mm., of female 4.5 mm.

Color: Extremely variable, as is **novella.** General ground color yellowish in males, paler in females. Vertex with a median brown line and four fuscous spots, one above each ocellus and one next each eye. Pronotum with a brown median line, a brown anterior border except medially, and two fuscous spots on disk; the anterior border in dark specimens with extensions backward that encircle the discal spots. Elytra with cells brown except costal area posterior to forking of sectors; veins pale.

Structure: Similar to **novella** but larger and more elongate with apices of elytra more broadly rounded. Second cross-vein between sectors of elytra absent.

External genitalia: Last ventral segment of female with lateral margins produced, posterior margin broadly and roundly excavated, the whole segment proportionally not so broad nor so deeply excavated as in **novella.** Male genitalia externally as in **novella,** the plates small and bluntly rounded, not covering the opening in the genital capsule.

Internal male genitalia: Aedeagus in lateral view broad and rather short, in dorsal view with a flange on each side near the lower edge, these slightly serrate on the outer edges; basal lateral processes obsolete. Tenth segment with posterior margins produced into long processes with flattened tips which curve downward distally. Pygofer hooks broad and stout, much wider than in **novella,** inner margins coarsely serrate.

Holotype male, allotype female, and 1 male and 6 female paratypes collected in the Santa Rita Mts., Arizona, June 27, 1933 by the writer; paratypes, 2 females, from the same locality, July 17, 1932, R. H. Beamer; 1 male from the same locality, June 12, 1933, R. H. Beamer; 4 males and 3 females from the Huachuca Mts., Arizona, June 11, 1933, 5 of them taken by the writer and 2 by R. H. Beamer. There are also specimens at hand from New Mexico, northern Arizona, southern Utah, Idaho, and northwestern Oregon.

Holotype, allotype, and paratypes in the United States National Museum collection (Cat. No. 50365),

paratypes in the collection of E. D. Ball and the University of Kansas.

This species was first thought to be extreme variation of **novella,** but examination of a large series of specimens has convinced the writer of its distinctness.

Aceratagallia truncata, n. sp.

Smaller than **californica** and less robust than **sanguinolenta,** with short blunt male plates. Most closely related to the **sanguinolenta** group. Length of male 3 mm., of female 3.25 mm.

Color: Indistinguishable in color characters from **sanguinolenta.** Very variable in intensity of coloration.

Structure: Similar to **sanguinolenta** but less robust, especially the males. Second cross-vein between sectors of elytra present or absent.

External genitalia: Last ventral segment of female slightly produced and rounded posteriorly, with a faint median notch. Male plates short, length about equal to basal width, posterior lateral angles rounded, tips together truncate.

Internal male genitalia: Posterior portion of style foot-shaped, much as in **sanguinolenta,** outer point sharp, inner point short, inner margin serrate, shank slender, ventral tooth short and near apex.

Best separated from **sanguinolenta** by the external genitalia of both sexes and from **poudris** by the more slender form.

Holotype male, allotype female, and 2 male paratypes from Lancaster, Calif., May 2, 1929, R. A. Blanchard. Also 2 male and 2 female paratypes from Big Bear Lake, Calif., July 26, 1932, R. H. Beamer, and 5 males and 5 females from Quincy, Calif., July 23, 1912. E. D. Ball. Holotype, allotype, and paratypes in the United States National Museum collection (Cat. No. 50366), paratypes in the collections of E. D. Ball and the University of Kansas.

Aceratagallia grisea, n. sp.

Related to **dondia** but smaller, with the color predominantly gray instead of brown and with the apex of

the male style not evenly rounded. Length 3 mm.

Color: General ground color pale gray, not brownish as in **dondia.** Clypeus usually pink tinged, sutures of face dark. Vertex with an oval, obliquely set black spot above each ocellus, a faint dark stripe each side of the median line, and a fuscous mark next each eye. Pronotal markings variable, the most constant being two fuscous stripes medially and a spot near each lateral margin. Veins of elytra intermittently marked with fuscous to black.

Structure: Shorter and even more robust than **dondia;** second cross-vein between sectors of elytra present.

External genitalia: Female genital segment typical of the **bigeloviae** group. Male valve and plates as in **dondia.**

Internal male genitalia: Style with apex more produced next outer point, not evenly rounded as in **dondia,** inner point larger than that of **dondia,** ventral tooth smaller and inconspicuous.

Distinguished from other species of the **bigeloviae** group by the shape of the male style, as well as by the size and color.

Holotype male, allotype female, and 18 paratypes representing both sexes from Ramsey Canyon, Huachuca Mts., Ariz., collected June 11, 1933 by the writer. Also 12 paratypes with the above data collected by R. H. Beamer. Holotype, allotype, and paratypes in the United States National Museum (Cat. No. 50367), paratypes in the collection of the University of Kansas and that of E. D. Ball.

Aceratagallia ovata, n. sp.

Related to **bigeloviae,** but resembling **aplopappi** in color; intermediate between the two in size, with apex of male style more produced next outer point than in **bigeloviae.** Length 2.75-3 mm.

Color: General ground color pale yellowish. Vertex with a fuscous spot over each ocellus and faint brownish marks medially and next each eye. Pronotum with indistinct brownish areas each side of median line. Elytral cells brownish; veins of coria fuscous except basally and next claval suture.

Structure: Most closely resembling **bigeloviae** but more robust; smaller than **aplopappi.**

External genitalia: Female genital segment with posterior margin notched three times as in **bigeloviae.** Male plates a little broader than those of **bigeloviae,** otherwise similar.

Internal male genitalia: Shank of style in ventral view broadened before middle and narrowed before foot, inner margin curved. Apex of style with posterior margin produced beyond an even curve next outer point which is well produced. Inner point small, ventral tooth small and inconspicuous.

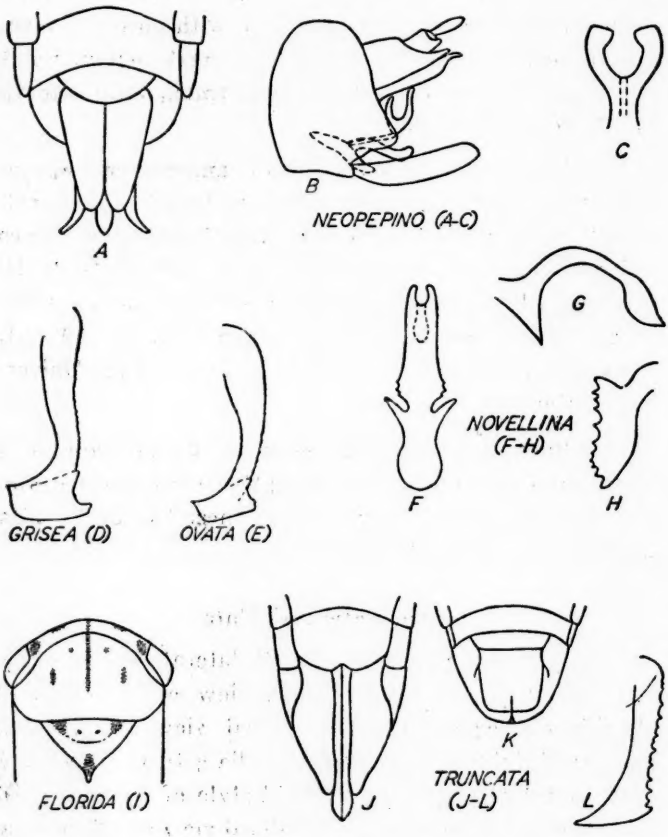
Holotype male, allotype female, and numerous paratypes from Yarnell Heights, Arizona, June 29, 1933, collected by the writer. Also male and female paratypes taken at the same locality on July 25, 1932, by R. H. Beamer. Holotype, allotype, and paratypes in the United States National Museum collection (Cat. No. 50368), paratypes in the collections of E. D. Ball and the University of Kansas.

In the writer's key this species and the preceding one both run to the couplet containing **bigeloviae** and **tergata,** but they are easily separated from these two by the size and color, as well as the genitalia.

Explanation of Plate

A, external male genitalia; B, lateral view of internal male genitalia, and C, caudal view of aedeagus of **Agalliopsis neopepino;** D, ventral view of posterior portion of right style of **Aceratagallia grisea;** E, ventral view of posterior portion of right style of **A. ovata;** F, ventral view of aedeagus; G, lateral view of left process of tenth segment, and H, caudal view of right pygofer

hook of **Agalliopsis novellina;** I, head and thorax of **A. florida;** J, female genitalia, K, male genitalia, and L, ventral view of posterior portion of male style of **Aceratagallia truncata.** In drawing C the magnification is approximately 140 times, I approximately 15 times, J and K approximately 35 times, L approximately 105 times, and all others approximately 70 times.



NEW ERYTHRONEURA OF THE OBLIQUA GROUP (HOMOPTERA, CICADELLIDAE)

R. H. BEAMER and M. E. GRIFFITH
Lawrence, Kans.*

The complexity of the genus **Erythroneura** is well illustrated by this study of a very small part of the extensive Obliqua group. The abundant intergradation which may be reasonably expected in closely allied species is particularly evident here. The external appearances are often so approximate in different species that separation without dissection and careful study of the male genitalia is a hopeless task. For example, **E. penenoeva** Beamer and **E. aspera** n. sp. are so alike in color and markings that they are practically indistinguishable, although they are easily separated by examination of the male genital structures.

The genitalia of more than two hundred male specimens of the species and varieties described in this paper have been dissected and studied, and some intergrading in the form of the genitalia has been observed. This is particularly evidenced in dissections of **E. dolosa occidua** n. var. and **E. dolosa interjecta** n. var., and, indeed, it is only by broad consideration of both internal and external characters in good representative series that these two varieties may be definitely separated.

The occurrence of **E. dolosa** n. sp. on **Crataegus** throughout the Northwest and its resemblance to **E. bifurca** Beamer and **E. plena** Beamer which are also found on that host plant suggests an interesting relationship between **Crataegus** and **E. dolosa** and allied species in widely separate localities. **E. dolosa** was collected on **Crataegus** in Spokane, Washington and **E. plena** from the same host in Hilliard, Florida! It would be a delightful study to trace the species of **Crataegus** and the attendant leafhoppers across North America, noting the variations in the insects and their host.

All types are in the Snow Entomological Collection.

E. insigna n. sp.

Resembles **E. cornipes** Beamer, but with posterior point of style much wider and tip of oedeagus more expanded.

General ground color semihyaline to yellowish white.

*Contribution from Department of Entomology, University of Kansas.

Vertex with orange or lemon-yellow inverted V, almost or just touching eyes; continued across pronotum as two diverging orange vittae. Tip and basal angles of scutellum orange or yellow. Usual oblique orange vittae on elytra; dusky spots before cross-veins. Face yellow; venter stramineous.

Male genitalia. Style with large foot; heel prominent; base usually straight, rarely inflated near heel; anterior point much reduced, more distinct than in **E. cornipes;** posterior point wider than in **E. cornipes,** width at base more than half its length, with sides rounded and converging. Oedeagus larger in every way than that of **E. cornipes;** in lateral view, curving dorsally; in ventral view, with apex much wider than in **E. cornipes,** about five times width of oedeagus just before expansion; tip deeply incised, hollow, forming broad, rounded arch; lateral projections flanking incision roughly truncate, frequently with recurving points on outer sides.

Holotype male, **Allotype** female, and 9 male **Paratypes,** Vernon B. C., Canada; August 5, 1931; R. H. Beamer. Other localities, same collector: Kelowna B. C., Canada; August 5, 1931. Bozeman, Mont.; August 13, 1931. Walnut, N. C.; August 20, 1931.

E. aspera n. sp.

Resembles **E. penenoeva** Beamer, but with anterior point of style longer than posterior point; oedeagus with processes longer, and tip straighter.

General ground color semihyaline to yellowish white. Vertex with yellow to orange inverted V, very near or touching eyes; continued across pronotum as two slightly diverging orange vittae. Scutellum typically dark, often light in summer specimens. Elytra with usual oblique orange vittae; dark spots before cross-veins. Face yellow; abdomen dark.

Male genitalia. Style with small foot; heel distinct; base short; anterior point usually twice as long as posterior point, very slender, width at base less than one-third length; posterior point short, with sides converging sharply, almost right angle, width of base and length subequal. Oedeagus almost straight; in lateral view, broad, distal half with slight but marked dorsad curve; pair of slender, roughened processes arising at base, extending nearly to flattened tip.

Holotype male, **Allotype** female, and 25 male **Paratypes,** Bliss, Idaho; July 7, 1931; R. H. Beamer. Other localities, same collector: Dixie, Ore.; July 8, 1931. Hope

B. C. Canada; August 1, 1931. Kelowna B. C., Canada; August 5, 1931. Vernon B. C., Canada; August 5, 1931. Republic, Wash.; August 6, 1931. Haugan, Mont.; August 9, 1931. Bozeman, Mont.; August 13, 1931.

E. dolosa n. sp.

Resembling **E. penenoeva** Beamer externally, but with genitalia very different, similar to **E. bifurca** Beamer, distinguished from latter species by more rounded sides of posterior point of style and longer anterior point.

General ground color semihyaline to yellowish white. Vertex with orange or yellow inverted V, slightly widened near and frequently touching eyes; continued across pronotum as two diverging orange to red vittae. Scutellum dark; tip orange or brown, darker patches in basal angles. Oblique orange to red vittae on elytra; dusky spots before cross-veins. Face yellow; prosternum and abdomen dark.

Male genitalia. Style with large foot; heel prominent; base almost straight, curving out slightly near middle; anterior point longer than in **E. bifurca,** width at base more than half its length, sides rounded and converging. Oedeagus closely resembling that of **E. bifurca;** in ventral view, with wing-like projections at base, of variable length; shaft straight, flattened at tip; long sword-shaped processes arising from base, flattened distally, usually serratulate, at least more roughened than in **E. bifurca,** and straighter.

Holotype male, **Allotype** female, and 35 male **Paratypes,** Spokane, Wash.; August 8, 1931; R. H. Beamer. Other localities, same collector: Hood River, Ore.; July 17, 1931. Vernon B. C., Canada; August 5, 1931. Oliver B. C., Canada; August 6, 1931.

Taken from **Crataegus.**

E. dolosa occidua n. var.

Approximating **E. dolosa** n. sp. but with foot much smaller and anterior point longer than posterior point. Genitalia closely resembling **E. dolosa interjecta** n. var., but with anterior point longer and with darker external markings.

General ground color semihyaline to yellowish white. Inverted V on vertex yellow; diverging vittae on pronotum orange. Scutellum dark. Oblique vittae on elytra red, orange, or yellow; dusky spots before cross-veins. Face yellow; abdomen dark.

Male genitalia. Style with small foot; heel distinct;

base nearly straight; anterior point narrow, longer than posterior point, latter about one-third length of posterior point in **E. dolosa,** almost as wide as long. Oedeagus as in **E. dolosa** but usually larger; in ventral view, with variable wing-like projections at base; long sword-shaped processes arising at base and extending to flattened tip of oedeagus frequently more expanded distally than in **E. dolosa.**

Holotype male, **Allotype** female, and 4 male **Paratypes,** Marin County, Calif., August 3, 1929; R. H. Beamer.

This variety closely resembles **E. dolosa** in external appearance and **E. dolosa interjecta** in the structure of the internal male genitalia. The intergradation of these three forms is especially evident in the latter case. However, **E. dolosa occidua** and **E. dolosa interjecta** differ so markedly in external appearance, occur in such widely separate localities, and apparently upon such different host-plants that, considering also the general differences in the genitalia, there can be little doubt that here are two distinct varieties of the species.

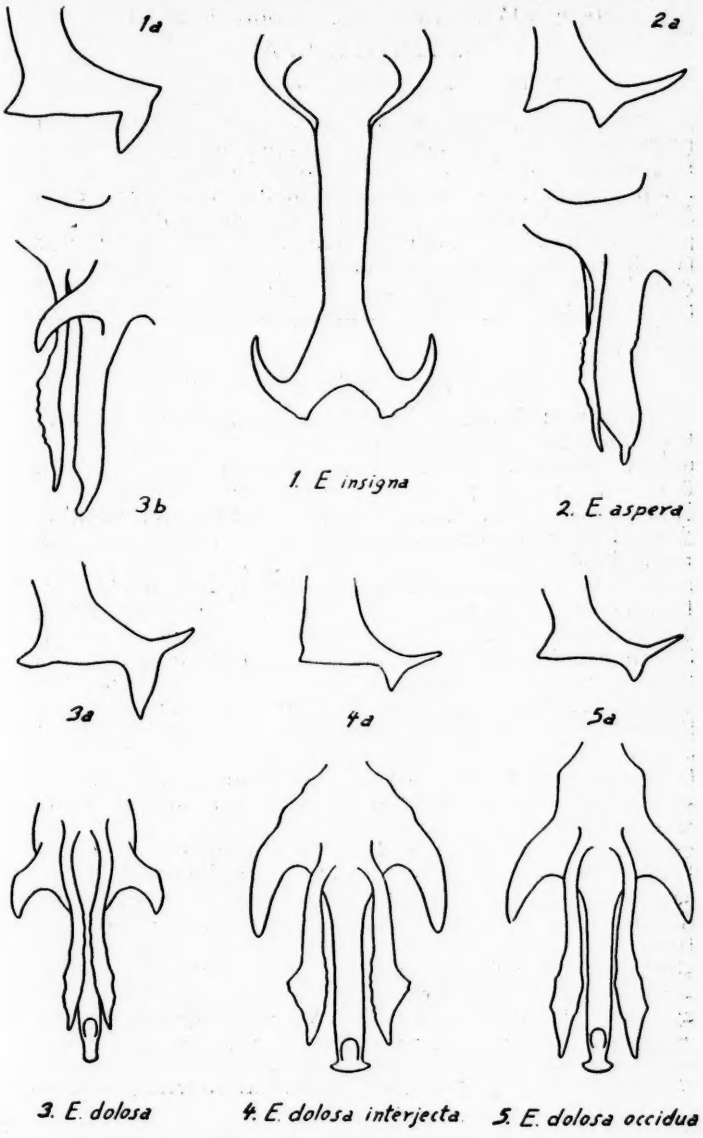
E. dolosa interjecta n. var.

Resembling **E. dolosa** n. sp. and **E. dolosa occidua** n. var., but with much lighter coloration; scutellum usually light; foot smaller, usually with anterior and posterior points subequal in length.

General ground color semihyaline to yellowish white; lighter in appearance than either **E. dolosa** or **E. dolosa** var. **occidua.** Vertex with bright yellow inverted V; continued across pronotum as diverging yellow vittae. Scutellum light, tip yellow, basal angles orange; infrequently darker. Oblique orange vittae on elytra; dark spots before cross-veins. Face light yellow; some dark on abdomen.

Male genitalia. Style with small foot; heel distinct; base straight; anterior and posterior points subequal in length, or anterior longer; anterior point sharp, narrow; posterior point with sides converging sharply, forming about 45 degree angle, about one-third as long as in **E. dolosa.** Oedeagus as in **E. dolosa** but usually larger; in ventral view, with variable winglike projections at the base; long sword-shaped processes usually broader distally than in **E. dolosa.**

Holotype male, **Allotype** female, and 13 male **Paratypes,** San Jacinto Mountains, Calif.; July 21, 1929; R. H. Beamer.


1a
2a
3b
1. E insigna
2. E. aspera
3a
4a
5a
3. E. dolosa
4. E. dolosa interjecta
5. E. dolosa occidua

A NEW MITE FROM THE COMMON SKUNK: MEPHITIS NIGRA*

HAROLD M. HEFLEY, Norman, Okla.*

The description which follows is of a lelapine mite parasitic on the common skunk. Specimens were taken in two localities in the State of New York; at Oswego County Sanitarium, in Oswego County, and near East Syracuse, in Onondaga County. They were collected and prepared by Mr. LeRoy C. Stegeman, to whom the writer is indebted for types of the parasite, and permission to describe it. The type is deposited in the collections of the University of Kansas. Paratypes are in the writer's collection.

Lelaps stegemani new species

Female: Medium sized, brownish golden mites with the following measurements: Body, ovoid, 0.8 x 0.51 mm. Chelicerae, 0.15 mm. long. Sternal plate, 0.11 x 0.07 mm., genital plate, 0.11 x 0.09 mm., ventral plate, 0.135 x 0.131 mm. Chelicerae short and stout; movable digit, 0.037 mm., fixed digit, 0.03 mm. long; basal segment, 0.04 x 0.025 mm., second segment, 0.035 x 0.020 mm., first segment including digits, 0.070 x 0.022 mm. Distance between seta on fixed digit and basal setae, 0.030 mm. Chelicerae, three jointed, the basal indistinctly separated from the second, one-fifth the length of the first pair of legs. Movable digit, stout, overlapping the end of the fixed digit, and bearing three broad teeth. Seta of fixed digit, long and stout, equal to the length of the movable digit. Fixed digit slightly more slender than the movable digit bearing one small tooth, and a small, curved seta. In addition to the usual digital setae, there are two others, situated near the base of the first cheliceral segment; the distal one slender, half the length of the proximal one, and pedunculated. Proximal seta, long, stout, and slightly longer than the digital seta. Sternal plate with three pairs of setae; genital plate distinctly separated from the sternal by a wide suture, slightly produced and acute at antero-lateral angles: separated from the ventral by a very indistinct and scarcely discernible suture. Ventral plate, weakly chitinised, bearing one pair of small setae on the lateral

Contribution from the Zoological Laboratories, University of Oklahoma. New Series No. 125.

margins. Anal plate, ovoid, with one pair of setae laterad from anus. Body of mite finely, evenly, densely striated; plates very finely, indistinctly tuberculated, with scattered small pits.

All coxae with a distinct tooth. First joint of third pair of legs with a distinct notch on disto-ventral border.

Male: Unknown.

Host: **Mephitis nigra** (Peale and Beauvois)

Locality: Onondaga and Oswego Counties, New York.

References Consulted.

Banks, Nathan
1915. The Acarina, or mites. U. S. D. A. Office of Secy. Rept. 108. 153 pp.

Canestrini, G. und Kramer, P.
1889. Demodicidae und Sarcoptidae. Das Tierreich, Lief 7, 193 pp.

Ewing, H. E.
1912. Origin and significance of parasitism in the Acarina. Trans. Acad. Sci. St. Louis, 21 (1): 1-70

1929. A manual of external parasites. xiv, † 225 pp. Baltimore.

EXPLANATION OF FIGURES

(Drawings were made with the aid of a camera lucida)

Figure 1. **Laelaps stegemani**; ventral view of female. From type female.

Figure 2. **Laelaps stegemani**; chelicerae of female, ventral view. From type female.

Figure 3. **Laelaps stegmani**; lateral view of chelicera of female.

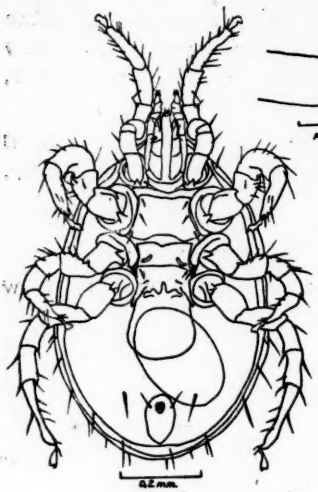


Figure 1.

Figure 3

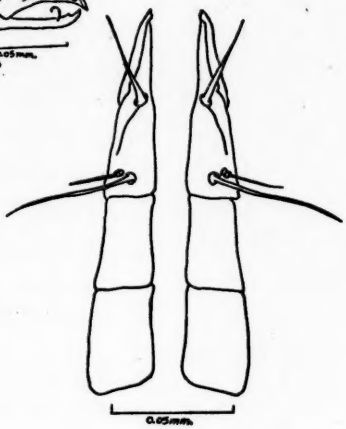


Figure 2.

NOTES

A TERMITE NEW TO KANSAS

On October 8, 1934, I was called to a residence in Lawrence to investigate a telephoned complaint about some flying insects that had taken possession of the house. I expected, of course, to find termites, but was not prepared to find a pale yellowish-brown species, since our common species, **Reticulitermes claripennis** Banks is dark in the winged stage. Specimens were sent to Dr. Nathan Banks and Dr. T. E. Snyder, both of whom identified the species as **Reticulitermes hageni** Banks. The insects were swarming out through a crack in the side wall of the fireplace in mid-day.

Doctor Snyder informs me that this is a new record for Kansas.

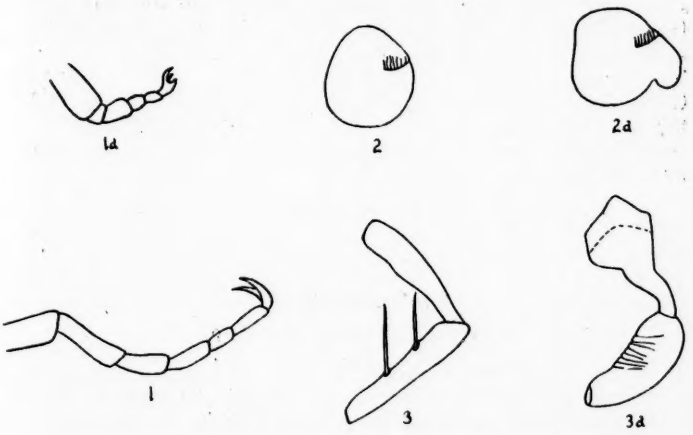
H. B. Hungerford.

MONSTROSITIES OBSERVED IN THREE SPECIES OF COLTOPTERA.

These abnormalities in structure, recently encountered, seemed interesting enough to be worthy of description.

A specimen of the elater, **Leptoschema discalceatum** Say,, has the left of the posterior pair of legs much diminished. The trochanter of the reduced limb is apparently normal in size and the femur almost so; the greatest reduction is in the tibia and the tarsus. The tibia is crumpled in appearance and decidedly shortened, but the tarsus is perhaps the most atrophied. There is an extra tarsal claw overhanging the usual two which are reduced in size. The length of both tibia and tarsus of the abnormal leg (Fig. 1a) scarcely equals that of the tarsus of the normal limb (Fig. 1).

In the Scarabaeidae, a male specimen of **Phyllophaga affabilis** Horn was examined and found to have a pendulous outgrowth on the right eye. Figure 2 illustrates the normal right eye and 2a the abnormal right organ.



A female specimen of the Carabid, **Abacidus permundus** Say, presents a curiously deformed labial palpus. Figure 3 shows the normal palpus and Figure 3a the last two segments of the abnormal appendage. The proximal segment may be described as larger in diameter than the normal one, smoothly curved on the outer side, but with

the inner side wrinkled and giving the appearance of both ends of the segment having been pushed toward each other. Both of the characteristic setae are missing. The last segment is much widened and flattened apically and somewhat triangular in outline.

Monstrosities are perhaps more common than supposed. In most insect orders careful observation not infrequently reveals interesting structural abnormalities.

Milton W. Sanderson and Melvin E. Griffith.

A BEETLE NEW TO KANSAS

On July 18, 1932, the writer found the Staphylinid **Trogophloeus incertus** Casey in tremendous numbers in a creek bed south of Lawrence. This creek, though flooded two weeks previously, was now very low. The banks were moist for about two feet above the water line and right along the edge of this moisture line the beetles were gathered in a line so black and dense as to be observable twenty-five feet away. This line was some four inches wide and about fifteen feet long, and there were several such lines. At places the insects spread out into areas a foot in diameter where, as well as in the lines, they were swarming as thickly as ants. Only a few were flying. This species which was not in The Snow Entomological Collection, was kindly identified by Dr. E. A. Chapin of the United States National Museum. This note is to record it in Kansas and particularly to record its occurrence in such unusual numbers.

Paul B. Lawson

ANNOUNCEMENT

Eleventh Annual Meeting
Kansas Entomological Society
University of Kansas, Lawrence, Kansas
March 30, 1935—9:30 a. m.—417 Snow Hall

President H. R. Bryson has called the eleventh annual meeting of the Kansas Entomological Society to be held at 9:30 a. m., March 30, 1935, in room 417 Snow Hall. A business meeting will be held beginning at 9:30, which will be followed by the presentation of papers. Papers also will be presented in the afternoon.

A SYSTEMATICAL AND MORPHOLOGICAL STUDY OF UTAH BOMBYLIIDAE, WITH NOTES ON SPECIES FROM INTERMOUNTAIN STATES[1]

By LUCILE MAUGHAN
Brigham Young University, Provo, Utah

Introduction

The study of the Bombyliidae of Utah and adjoining states attracted the attention of the writer because of the importance of the group. It is one of the largest of the families of Diptera, and of considerable economic importance. The larvae are parasitic upon the immature stages of other insects, and have been found breeding in several of the orders of insects, including the common cut-worm, Noctuid larvae, and the egg cases of grasshoppers. Very little is as yet known about the life histories of any but a few species, and a study of this subject and the economic importance of the different species should no doubt reveal much of interest. Before this can be done thoroughly, however, it is well to study the taxonomy and morphology of the group, and it was from this point of view that the present study was made.

A survey of the literature reveals the fact that the family Bombyliidae is one of the many groups of intermountain insects that has received little attention from entomologists. Descriptions and occasional notes are scattered here and there, but no attempt has been made to bring these together. Especially is this true of Utah forms. Examination of the literature shows only five workers who have published on Utah forms. Aldrich (1905) gives three references to published records of species collected in Utah, with Utah as type locality for two of these species. Knowlton (1930) gives a brief life history note on **Villa molitor** (Loew), and (1931) lists nineteen species in eight genera with locality records on each. Painter (1933) describes **Villa spaldingi** with Utah as type locality, and **V. edititoides** Painter and **V. nigronasica** Painter of which he has paratype specimens from Utah. Outside of these records, nothing has been found concerning the large and varied Bombyliid fauna of Utah.

At the Brigham Young University there has been built up, during the last few years, a large and fairly com-

1 Contribution No. 49 from the Dept. of Zoology and Entomology, Brigham Young University, Provo, Utah.

plete collection of Bombyliidae from all parts of the state of Utah, with a fair representation of species from surrounding states. The study of this collection was undertaken as a master's thesis. This paper is an abridgment of the thesis, and contains keys to the genera and species, distributional records, and occasional notes, together with descriptions of two new species and three plates of drawings. It has been necessary to omit most of the descriptions and comment on the species in order to keep this paper within suitable limits for publication.

A work of this kind would be impossible without the assistance of others. The writer wishes especially to express her appreciation to Dr. Vasco M. Tanner, under whose direction this dissertation has been carried on, for much valuable help, advice, and encouragement in the preparation of this paper, and who, through the past few years has collected the literature and a large part of the specimens used.

To Dr. Reginald H. Painter, of the Kansas State College, the writer also wishes to extend thanks and appreciation for so kindly determining the species listed in this paper, and also for the helpful notes and information.

She also wishes to thank those students who have collected specimens used, and who have given encouragement to this work.

Genera of Bombyliidae

Aldrich (1905) lists forty-one genera of Bombyliidae. Since his catalogue was published, other genera have been recognized; and three of these—**Poecilanthrax** O. S., **Dicranoclista** Bezzi, and **Neacreotrichus** Cockerell—contain species from Utah.

Twenty-two genera are considered in this study, and one-hundred and thirty species. Of these, one-hundred and eighteen species and all genera have been taken in Utah. All but two of the species discussed here are found in the collection at the Brigham Young University. Two of the species are named as new to science. Types and paratypes of these are in the collection, and also paratypes of **Villa spaldingi** Painter, **V. nigronasica** Painter, and **V. edititoides** Painter, described by him (1933).

Of the twenty-two genera considered here it is interesting to note that many are confined partly or wholly to Western North America. Ten genera, viz: **Villa, Dipalta, Anthrax, Exoprosopa, Systropus, Anastoechus, Systoechus, Bombylius, Geron, Poecilanthrax,** are widely

distributed over the United States, **Lepidanthrax** is confined to North America and Australia, while **Bombylius, Systoechus, Anastoechus, Conophorus, Systropus, Phthiria, Geron, Aphoebantus, Anthrax, Exoprosopa, Villa,** are world-wide in distribution. Most of the species seem to be more or less restricted in their range, but many are country-wide, and some Holartic.

In order to make a careful study of the genera represented in this paper the general morphology of each was studied and three plates of drawings prepared. These drawings are all freehand, but have been carefully measured and drawn to scale. Pile, tomentum, and bristles have been omitted from the drawings. The morphological characters such as antennae and wings are figured for each genus except where there is great similarity. General morphology is figured for **Villa alternata** (Say) as being typical of the family, and the genitalia, wings, etc., of the new species described here are also included. Similar drawings of **V. cauter** (Coq.) have been included for comparative purposes. It is hoped that these drawings will be of assistance in further study of Rocky Mountain species.

The table of genera given here is based upon that of Coquillett, which uses chiefly the wings and antennae as differentiating characters. The tables to the species of **Villa, Poecilanthrax, Conophorus, Lordotus, Phthiria,** and **Aphoebantus,** are also based on Coquillett's work. However, only the genera and species at hand have been included in these tables, so considerable revision has been necessary in some places. Other keys have been arranged by the writer after studying the specimens at hand.

The pile and tomentum are very important specific characters, and it is necessary to be very careful when collecting Bombyliidae or the vestiture will be destroyed. The best method is to collect them in small jars and only a few in a jar. They should be pinned before they set, as relaxing and handling tends to destroy the pile and tomentum.

Table Of Genera

1. The bifurcation of the radial sector takes place at or very near the r-m cross-vein, R-2+3 forms a knee at its origin 2

   The bifurcation of the radial sector takes place at a greater distance from the cross-vein, usually at an acute angle 7

2. Antennal style separated from third joint by a distinct suture (Figs. 10 and 14) 3
Third joint not with a distinct, suturally separated style, the style when present, very minute (Fig. 9); hind border of eye more or less indented 5

3. Antennal style with a pencil of hairs at the tip (Fig. 14); pulvilli distinct; front tibiae with bristles; no sectoral cross-vein present 4
Antennal style not terminating in a pencil of hairs; cell R-3 divided by a sectoral cross-vein (Fig. 26); posterior claws with a basal tooth; pulvilli vestigial or wanting ..... **Exoprosopa** Macq.

4. Cell R-4 not bisected by a cross-vein (Fig. 25) ..... **Anthrax** Scopoli
Cell R-4 bisected by a cross-vein (Fig. 55) ..... **Dicranoclista** Bezzi

5. Vein R-2+3 strongly contorted at the distal end in the shape of a recumbent letter S; sectoral cross-vein present (Fig. 28) ..... **Dipalta** O. S.
R-2+3 not so contorted; usually no sectoral cross-vein 6

6. The contact of cell 1M-2 with cell Cu-1 as long as or longer than base of Cu-1 (Fig. 36); scales of abdomen mostly broad; third antennal joint with long, very slender prolongation on a short conical base (Fig. 13) ..... **Lepidanthrax** O. S.
Contact of cells named shorter than base of Cu-1, usually punctiform (Fig. 27); scales of abdomen entirely or mostly narrow; antennae various; hind border of eye indented noticeably; face and front well clothed with scales; scutellum usually black ..... **Villa** Lioy
Venation similar to **Villa,** often spurious veins present; scales on face and front almost completely lacking; face and lower front yellow or reddish; face conically produced; hind border of eye very slightly indented; antennae with third joint cone-shaped tapering; wings usually mottled over much of area; scutellum red ..... **Poecilanthrax** O. S.

7. Wings having cell M-1 present 8
Wings having no cell M-1 present 17

8. Cell R-5 closed, or at most very narrowly open; no sectoral cross-vein present 9
Cell R-5 open 12

9. Cell R longer than cell 2M; proboscis more or less elongate; anal cell usually open; veins R-5 and M-1 join at some distance from the border of the wing (Figs. 33, 34) 10
Cell R not longer than cell 2M; r-m cross-vein situated near base of cell 1M-2 (Fig. 8) 11

10. Head comparatively small; the emargination of the occipital orbits almost imperceptible (Wing Fig. 34) ..... **Bombylius** Linne
Head broad; emargination of the occipital orbits distinct (Wing Fig. 33) ..... **Heterostylum** Macq.

11. Face prominent, moderately pilose; frons of male narrow. (Wing Fig. 8) ..... **Systoechus** Loew
Face rounded, densely pilose; frons of male broad ..... **Anastoechus** O. S.

12. Sectoral cross-vein present or not (Fig. 32); first antennal joint very greatly swollen (Fig. 20); proboscis not longer than to tip of antennae ..... **Conophorus** Meig.
Sectoral cross-vein present (Fig. 35); first antennal joint normal (Fig. 18); scutellum convex ..... **Lordotus** Loew
Sectoral cross-vein absent; if first antennal joint is slightly swollen, proboscis is longer than to tips of antennae 13

13. Cell 1A closed (Fig. 31); proboscis elongate 14
Cell 1A open; body clothed chiefly with hair, or nearly bare 15

14. Third joint of antennae with long bristly hairs (Fig. 56); face long pilose ..... **Neacreotrichus** Cockerell
Third joint of antennae without, or with short bristly hairs above (Fig. 16); face bare or short pilose; (Wing Fig. 31) ..... **Phthiria** Meigen

15. Cells R and 2M of nearly equal length (Fig. 30) ..... **Sparnopolius** Loew
Cell R distinctly longer than cell 2M 16

16. Third antennal joint but little longer than the first; mesonotum of male sometimes muricate and the costa denticulate (Wing Fig. 29) .... **Eclimus** Loew
Third joint of antennae more than twice the length of the first, bulbous at base (Fig. 21); vein Rs branches before the proximal end of cell 1M-2 in an acute angle (Fig. 40); face retreating in profile ..... **Aphoebantus** Loew

17. Vein R-2+3 joins R-1 far from apex of wing (Fig. 37); antennae with second joint longer than first ..... **Mythicomyia** Coq.
Vein R-2+3 is free to edge of wing 18

18. No sectoral cross-vein present 19
Sectoral cross-vein present (Fig. 43); body clothed with more scales than hairs, usually with thoracic bristles; abdomen decumbent; antennae long (Fig. 48) ..... **Toxophora** Meigen

19. Third antennal joint broadly rounded or truncated apically, style in shallow notch near upper angle (not apex) (Fig. 22, wing, Fig. 38) .... **Rhabdoselaphus** Bigot
Third antennal joint broadest at base, tapering to a point. (Fig. 23, wing Fig. 39) .... **Geron** Meigen

Anthrax Scopoli 1763

The genus **Anthrax** Scopoli has formerly been known as **Spogostylum** Macquart, but this is now considered a synonym by Roberts (A revision of the Australian Bombyliidae, 3 parts. Proc. Linn. Soc. New South Wales, Vol. 53, 54, p. 136), and Professor Painter also holds this view.

This genus is characterized as follows: The radial sector is branched near the r-m cross-vein; R-2+3 forms a knee near its origin, which frequently bears a spurious vein (Fig. 25). The third joint of the antennae has the basal part onion shaped or subglobular, and the style bears a pencil of hairs at its tip (Fig. 14). The front tibiae are provided with bristles, and the pulvilli are distinct.

Table of Species

1. Black species, halteres tipped with yellow; wing without a cross-vein dividing cell 2M-2 2
Mostly black, face, lower front, and sides of occiput a dark blackish red, halteres black; cell 2M-2 with reddish black markings covering nearly all veins ..... **tigrina** (de Greer)
Distribution: Utah, new record: Washington Co., Zion National Park (Tanner, A. M. Woodbury).

2. Base of wings black, extending from apex of Sc to base of medial cross-vein, then basally along vein M-3+Cu-1, across base of cell Cu, then along Cu-2 to apex of vein 1A, and to edge of wing, leaving apex of cells 1A and 2A hyaline;

hyaline spot in cell 2M at base of cell 1M-2; cell 1A closed before margin of wing .... **anale** Say or **argentatum** (Cole)

Distribution: Utah, new record: Cache Co., Wellsville Canyon, June, 1926 (Tanner).

Wings spotted with black or brownish-black; cell 1A open or at most closed at border of wing 3

3. A row of fine spots of black fill costal cell; spots on parts of veins running cross-wise of wing; remainder of wing more or less completely covered with fine spots of color; cell 1A narrowly open, or closed on margin of wing .... **irrorata** Say

Distribution: Utah, new records: Rich Co., Bear Lake Valley (Hayward); Wasatch Co., Summit Daniels Canyon, 8000 feet, July, 1926 (Brown); Utah Co., Provo (Johnson); Grand Co., Moab (Tanner); Washington Co., St. George, reared from nest of **Bremus morrisoni** (Cress.), (L. A. Woodbury), Zion National Park, (A. M. Woodbury).

Idaho: Moscow (Sudweeks).

New Mexico: Jemez Spring, 1914 (J. Westgate).

Colorado: Estes Park, 7000 feet, August, 1932 (Tanner); Glenwood Springs, 5747 feet, August, 1932 (Tanner).

Wings not so spotted 4

4. Black spots on all vein intersections 5

Black spots only on bases of Rs, R-2+3, and Cu-1, and the r-m cross-vein ..... **pauper** (Lw.)

Distribution: Utah, new record: Utah Co., Provo (Johnson).

5. Tomentum black and white; costal cell mostly hyaline, four spots of black in cell R-2+3 .... **seriepunctata** (O. S.)

Distribution: Utah, new record: Rich Co., Bear Lake Valley (Hayward).

Tomentum yellowish brown, black, and white; costal cell black, two spots of black in cell R-2+3 ..... **varia** Fab.

Distribution: Utah, new record; Utah Co., Provo (Johnson).

Dicranoclista Bezzi 1924

This genus has recently been separated from the

genus **Anthrax** and differs from it in having cell R-4 divided by a cross-vein (Fig. 55). The antennae are like those of **Anthrax** (Fig. 14), and the other general characters are the same, viz: front tibiae with bristles and pulvilli distinct. The genus is represented by only one species from Utah.

Dicranoclista vandykei (Coq.)

The species was originally described as **Spogostylum vandykei** Coq. All the pile and tomentum is golden in color. Face heavily clothed with tomentum, thorax very sparsely, and dorsal abdominal tomentum confined to posterior margin of each segment, which otherwise appears polished and bears scant erect pile. Tomentum of head and abdomen slightly more of a yellow than the pile. Entirely black species except for ventral sclerites of abdomen which are yellow.

Distribution: Utah, new record: Utah Co., Provo (Johnson).

Exoprosopa Macquart 1840

This genus has the Rs branched near the r-m cross-vein and R-2+3 forms a knee at its origin. A sectoral cross-vein is present dividing cell R-3 in two (Fig. 26). The cone-shaped third joint bears a terminal style having no hairs upon it (Fig. 10). The pulvilli are vestigial or wanting and the posterior claws have a basal tooth.

Table of Species

1. Wings smoky or brownish and hyaline, color limited to base and front of wing, outline indistinct; cell 2A hyaline except at base 2

   Wings with cross-bands or spots of brown or blackish color 7

2. At least segments one to four or five of abdomen red on venter 3

   Abdomen black, legs black, tomentum of sides of occiput silvery; pile yellowish; tufts of white on sides of all segments except first; wing color dark brown, extending from the Sc vein to the r-m cros-vein, and basally to the posterior arculus; a brown cloud on bases of Cu-1 and the medial cross-vein ..... **titubans** O. S.

   Distribution: Utah, new records: Garfield Co., Bryce Canyon (Tanner); Grand Co., Moab (L. K. Gloyd).

3. Venter of abdomen mostly red, including segments six and seven; legs red 4

Segments six and seven black; legs black; bands of white tomentum on segments two, four, and seven, broad bands of black on two and three, and broad bands of golden-brown on three, five, and six of abdomen; wing color brownish black, distributed similarly to that of **titubans** O. S..... ..... **agassizii** Lw.

Distribution: Utah, new record: Utah Co., Provo (Johnson.)

New Mexico: Jamez Springs, Aug. 24, 1914.

4. Abdomen narrowly red at sides; probòscis projecting at least one-fourth its length beyond oral margin 5

Abdomen broadly red at sides; proboscis not, or scarcely projecting 6

5. Proboscis projects about one-fourth its length; abdomen faintly red at sides and posterior margins of the segments; face and front black except oral margin yellowish red; labial palpi black; coxae greyish black; wing color light brown, extending from tip of vein Sc slantwise to M-1+2, then posteriorly along this vein to branching of M, and to axillary incision; a faint cloud is present on free part of Cu-1 ..... **dodrans** O. S.

Distribution: Colorado: Ft. Valley School, 6000 feet, August 1932 (Hayward).

Proboscis projecting more than one-half its length; abdomen red at sides of segments 2 and 3, and very narrowly red at sides of 4 to 7, and on posterior margins; front black, face red with black spot in center; labial palpi and oral margins yellow; coxae yellow; wing coloration practically same as above ..... **dodrina** Curran

Distribution: New Mexico: Jemez Springs, August, 1914 (J. Westgate).

6. Occiput black; abdomen yellow pilose; wing coloring dark brown, boundary running from apex of Sc through base of 2M-2, Cu-1, 1A, and 2A ..... **hulli** Painter

Distribution: Mexico: Colonia Dublan, Chic., July, 1931 (Beck and Call).

Occiput largely red; abdomen yellow and scant black pilose; wing coloring light brown, boun-

dary running from apex of Sc through base of R-5, indistinctly through 1M-2 and 2M to posterior arculus, and along 1A and 2A a short distance, with clouds at base of Cu-1 and the medial cross-vein ..... **xanthina** Painter

Distribution: Utah, new record: Washington Co., St. George, August, 1926 (Tanner).

7. Wings with solid bands of color extending to or near hind margin of wing in cells 1A and 2A 8

Color of wings pale brown, an irregular band extending from cell 1M-2 through base of Cu-1 and apex of 2M, across 1A and into 2A; another irregular band from vein R-1, across middle of cells R-1, 1R-3 and R-5 to vein M-1+2, and spots on the r-m cross-vein and M-2 distad of the medial cross-vein; white tomentum on segments 2, 4, 6, and 7 of abdomen; ground color of abdomen varies greatly in amount of black present ..... species dubious, maybe new.

Distribution: Utah, new record: Utah Co., Provo (Johnson).

8. Abdomen broadly black 9

Segment one of abdomen black, and black triangles on segments 2, 3, and 4; rest of abdomen red, tomentum of abdomen largely black, with silvery band of tomentum on base of segment 2 and maybe on other segments; pile of segment one dark golden brown, rest on abdomen black; wings with narrow strip of hyaline extending from just distad of the humeral cross-vein, basally to margin of wing distad of the axillary incision, this strip broadens slightly in cell 2A; three small hyaline spots in cell R-1 and in 1R-3 ..... **caliptera** (Say)

Distribution: Utah, new records: Boxelder Co., Raft River Mountains, 10,000 ft., June, 1928 (Tanner); Utah Co., Provo (Maughan, Johnson); Sanpete Co., Indianola (Tanner).

9. Hyaline or subhyaline spot in base of costal and subcostal cells; legs red, may have tips of tarsi black 10

Costal and subcostal cells entirely dark brown or smoky; legs black or red with black tarsi 11

(Concluded in Vol. 8, No. 2)

Volume 8, No. 1, January, 1935. Mailed January 19th, 1935.

REPRINT PRICES
JOURNAL OF THE KANSAS ENTOMOLOGICAL SOCIETY.

pp.	25 cop.	50 cop.	100 cop.	500 cop.
1— 2	$ .50	$ .75	$ 1.40	$ 6.50
3— 4	1.00	1.75	2.80	11.00
5— 8	1.40	2.80	5.60	20.00
9—12	2.00	4.00	8.00	32.00
13—16	2.50	5.00	9.00	36.00
17—20	3.00	6.00	10.00	40.00
21—24	3.50	7.00	11.00	44.00
25—28	4.00	8.00	12.00	48.00
29—32	4.50	9.00	13.00	52.00
Tables—for setting up—$1.75 per page.				
Covers	—	—	2.50	7.50

Charges for postage or express on carriage of reprints are extra.

PRICES OF BACK VOLUMES

Volume 1 ..... $2.00
Volumes 2 to 8 ..... 1.00
Volume 8 ..... 1.50

Send your subscriptions for back volumes or numbers to the Secretary-Treasurer, Department of Entomology, K. S. C., Manhattan, Kansas.

CONTENTS OF THIS NUMBER

NEW SPECIES OF GALL MIDGES FROM TEXAS—E. P. FELT 1

NEW NORTH AMERICAN AGALLIAN LEAFHOPPERS WITH NOTES ON OTHER SPECIES—P. W. OMAN 9

NEW ERYTHRONEURA OF THE OBLIQUA GROUP—R. H. BEAMER and M. E. GRIFFITH 17

A NEW MITE FROM THE COMMON SKUNK: MEPHITIS NIGRA—HAROLD M. HEFLEY 22

NOTES—H. B. HUNGERFORD—MILTON W. SANDERSON and MELVIN E. GRIFFITH—PAUL B. LAWSON 24

ANNOUNCEMENT 26

A SYSTEMATICAL AND MORPHOLOGICAL STUDY OF UTAH BOMBYLIIDAE, WITH NOTES ON SPECIES FROM INTERMOUNTAIN STATES—LUCILE MAUGHAN 27

JOURNAL OF THE KANSAS ENTOMOLOGICAL SOCIETY

Publication Office, 119 South Main Street, McPherson, Kansas, W (arren) Knaus, Publisher

A quarterly journal published in January, April, July and October, devoted to Entomology in the Western Mississippi Basin and the proceedings of the Kansas Entomological Society.

Manuscripts for publication may be sent to any of the publication committee.

The Kansas Entomological Society does not make exchanges since the Society does not maintain a library.

Subscription to the Journal must be paid in advance. The subscription rate is so low that second notices are not ordinarily sent out.

Payment of Canadian or other foreign subscriptions and bills must be made by International Postal Money Order or by a draft on a New York bank and payable in U. S. A. dollars.

Subscribers are urged to give us their full cooperation in these matters.

Subscriptions should be sent to the office of Publication, 119 South Main Street, McPherson, Kansas.

Subscription in the U. S. A.,	**$1.50 per year**	**Single Copy**
Canadian or foreign subscriptions,	**1.75 per year**	**60 cents**

KANSAS ENTOMOLOGICAL SOCIETY

President H. R. Bryson, Kansas State College, Manhattan.
Vice-President D. B. Whelan, University of Nebraska, Lincoln.
Sec.-Treas. R. L. Parker, Kansas State College, Manhattan.

T 1
. . 9
. 17
. . 22
. . 24
. 26
I 27

s,

ober.
pro-

olica-

nges

sub-
out.
bills
't on

hese

outh

Copy
ts

n.